

UNDRO NEWS

March/April 1991

- **Tragic Cyclone
in Bangladesh**
- **The Sanitary Revolution:
A Paradigm for Disaster Mitigation**

OFFICE OF THE UNITED NATIONS
DISASTER RELIEF
COORDINATOR



BUREAU DU COORDONNATEUR
DES NATIONS UNIES POUR LES
**SECOURS EN CAS
DE CATASTROPHE**

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Editorial

Millions of people in Africa, Asia and the Middle East will not easily forget the spring of 1991 which brought in its wake a series of man-made and natural disasters. In Bangladesh, an estimated 138,000 died in a cyclone and subsequent floods which swept a swath of destruction from Cox's Bazaar in the East to Khulna in the West. Famine and drought, compounded by civil war, in countries of the Horn of Africa and other parts of the continent killed many; thousands more are on the brink of starvation and an estimated 30 million are at risk. In Iraq, hundreds of thousands of Kurds fled their homes to the Iranian and Turkish borders in the aftermath of the Iraq/Kuwait war. Thousands died from hunger and exposure in the mountains.

The response of the international community to these catastrophes ranged from rapid mobilization of help to the Kurds to a mood of rather less urgency to rush aid to the millions of sick and starving in Africa. Assistance to Bangladesh, which got off to a slow start, improved substantially by mid-May. Scholars may, in time come up with answers to the puzzling phenomenon of differing international response to these disasters: well over US \$530 million worth of assistance donated for an estimated 1.5 million Kurdish refugees, and US \$300 million for the 9.8 million Bangladeshis affected by the cyclone. While no comprehensive figures for contributions to emergency relief in Africa are available, an appeal launched in mid-May by the Secretary-General of the United Nations noted a shortfall in food aid of 1.8 million tons, valued at over US \$900 million. UNICEF's emergency appeal for 10 African countries, covered by the Secretary-General's appeal of 12 May, had raised only US \$15 million against US \$110 million required, with no contributions whatsoever for Ethiopia, Malawi and Somalia.

No doubt, more help is on the way for Africa and Bangladesh; but the sense of urgency which marked the delivery of supplies to the Middle East is not

Le printemps de l'année 1991 restera longtemps gravé dans la mémoire de millions de gens, victimes d'une véritable série noire de catastrophes naturelles ou provoquées par l'homme, en Afrique, en Asie et au Moyen Orient. Au Bangladesh, environ 138 000 personnes ont trouvé la mort lors d'un cyclone suivi d'inondations qui ravagèrent toute la côte du pays d'Est en Ouest, de Cox's Bazaar à Khulna. Dans la Corne de l'Afrique, ainsi que dans d'autres parties du continent, beaucoup ont été décimés par la famine et la sécheresse, sans parler de la guerre civile. Ils sont des milliers à n'avoir presque rien à manger. Au total, 30 millions d'Africains risquent de subir le même sort. En Irak, plusieurs centaines de milliers de Kurdes, fuyant la guerre, ont quitté leurs foyers pour se réfugier aux frontières iraniennes et turques. Des milliers d'entre eux ont succombé à la faim et au froid dans les montagnes.

Face à ces catastrophes, la réaction de la communauté internationale s'est traduite par un rapide déploiement d'assistance aux Kurdes et par une mobilisation sensiblement plus lente de l'aide aux millions d'affamés en Afrique. Quant au Bangladesh, où les secours ont mis un certain temps à arriver, l'assistance s'est considérablement accrue vers la mi-mai. Ceux qui se pencheront sur la question sauront peut-être, avec le recul, dire pourquoi l'action internationale est inégale d'une catastrophe à l'autre: plus de 530 millions de dollars E.-U. d'aide pour un million et demi de Kurdes; 300 millions de dollars pour les 9,8 millions de sinistrés du Bangladesh. Bien qu'aucun chiffre ne soit disponible pour l'ensemble des contributions pour l'Afrique, l'appel lancé par le Secrétaire général le 12 mai, fait état d'un déficit alimentaire de 1,8 million de tonnes, estimé à 900 millions de dollars. Sur les 110 millions de dollars demandés par l'UNICEF, dans le cadre de l'appel du Secrétaire général des Nations Unies, afin de venir en aide à dix pays africains, seuls 15 millions ont été reçus. Aucune contribution n'a été faite pour l'Éthiopie, le Malawi et la Somalie.

Nul doute que l'aide pour l'Afrique et le Bangladesh n'aille en augmentant. Mais la distribution des

so apparent in the operations to rescue the victims in other emergencies, particularly those in Africa. The question is: Does this portend the onset of aid fatigue on the part of the major aid donor nations? True, Africa and Bangladesh have been hit by natural disasters, and Africa by civil disturbances, more than once during the past few years, resulting in massive mobilization of relief aid. But although the scale of the disaster this time is stated to be even more devastating, help has not been as forthcoming as in the past.

UNDRO, whose mandate includes promoting the prevention and control of disasters, is actively involved, in partnership with the UN Development Programme and others, in developing disaster mitigation activities and projects aimed at reducing the dependency of disaster-prone developing countries on international assistance, when coping with the consequences of natural hazards. By the year 2000, the International Decade for Natural Disaster Reduction, IDNDR, is also expected to achieve significant progress in helping vulnerable countries to reduce human and economic losses caused by disasters.

An encouraging development of the late 70s and the 80s has been the compassionate commitment of the international community to come to the aid of their fellow-human beings who had become victims of disasters in different parts of the world. This assistance was extended ungrudgingly, with political considerations paying a minor part in the allocation of humanitarian/disaster relief aid. The latest disasters to hit Bangladesh and creep across the African continent call for a renewed commitment on the part of the donor community to international humanitarian relief and, in this context, to consider humanitarian issues only. Demands on the generosity of traditional donors have been particularly high over the past few months and "aid fatigue" may not be the only culprit. However, as recent trends show, the number and severity of disasters are unlikely to diminish in the immediate future, and the international community should brace itself to committing greater resources for international relief assistance in the years to come, pending greater self-reliance and resilience to disasters on the part of disaster-prone countries, as a result of improved disaster mitigation.

secours aux victimes de ces catastrophes, et plus particulièrement en Afrique, n'a pas revêtu le même caractère d'urgence qu'au Moyen Orient. Cela ne trahirait-il pas une certaine "lassitude" des principaux pays donateurs ? L'Afrique et le Bangladesh ont certes subi de nombreuses catastrophes naturelles au cours de ces dernières années, et l'Afrique a de surcroît été le théâtre de conflits civils. Ces événements ont donné lieu à une mobilisation d'aide massive. Cette fois, en dépit de l'ampleur quasi sans précédent des catastrophes, l'aide n'est pas aussi généreuse que par le passé.

L'UNDRO, dont le mandat englobe la prévention et le contrôle des catastrophes, s'emploie à promouvoir, en collaboration avec d'autres agences et notamment le Programme des Nations Unies pour le développement, des activités et des projets pour l'atténuation des désastres. Ceci devrait permettre de réduire la dépendance, vis-à-vis de la communauté internationale, des pays sujets aux catastrophes. La Décennie internationale pour la réduction des catastrophes naturelles devrait également jouer un rôle important, d'ici l'an 2000, en fournissant aux pays vulnérables des moyens de limiter les pertes économiques et en vies humaines causées par les catastrophes.

Depuis la fin des années 70 et tout au long des années 80, l'engagement croissant de la communauté internationale à l'égard des victimes de catastrophes aux quatre coins du monde a représenté un grand pas en avant. Cette aide était accordée spontanément et les considérations politiques entraient peu en ligne de compte lorsqu'il s'agissait de soutien humanitaire et de secours d'urgence. La récente catastrophe au Bangladesh et celles qui sévissent en Afrique exigent de la part des donateurs un nouvel effort sur le plan de l'aide internationale, en ne tenant compte que de l'aspect humanitaire. Les donateurs habituels ayant été particulièrement sollicités au cours de ces derniers mois, il se peut que la "lassitude" ne soit pas la seule coupable. Toutefois, ainsi que les derniers événements le prouvent, il est peu probable que le nombre et la gravité des catastrophes diminuent dans l'immédiat. La communauté internationale devrait se tenir prête à allouer des sommes plus importantes pour l'urgence dans les années à venir, en attendant que les progrès accomplis dans le domaine de l'atténuation des catastrophes assurent aux pays "à risque" une plus grande autonomie et une capacité accrue de réponse aux catastrophes.

Tragic Cyclone in Bangladesh

Since the beginning of this century, 55 cyclones have hit Bangladesh, wreaking havoc and destruction in their path. The latest cyclone of 30 April 1991, one of the most destructive on record, devastated the entire coastline of the Bay of Bengal, from Cox' Bazaar and Chittagong in the East to Khulna in the West. A tidal wave, over 20-feet high, submerged a number of small

and large offshore islands. The estimated death toll exceeded 138,000 by mid-May, but was expected to rise as more information came in from remote and isolated areas.

At the request of the Secretary-General of the United Nations, the UN Disaster Relief Co-ordinator went to Bangladesh to assess the damage and needs. On the day of

his arrival in Dhaka, on 5 May, Mr. Essaafi accompanied the Prime Minister of Bangladesh, Begum Khaleda Zia, on an aerial survey of Chittagong and other affected areas. Also taking part in that survey were Prime Minister Nawaz Sharif of Pakistan; France's Minister for Humanitarian Action, Bernard Kouchner; and Mother Teresa. Subsequently, they visited devastated



D. MCCLEAN Photo

Hundreds of miles of roads and embankments were washed away and thousands of boats lost.

areas by road., The next day, Mr. Essaafi reviewed the situation in detail with the Prime Minister, the Foreign Minister, the Minister for Relief and Rehabilitation and senior government officials. He also met with representatives of donor countries, United Nations agencies and some non-governmental organizations in Dhaka.

Mr. Essaafi, who had visited Bangladesh in 1987 and 1988 in the wake of earlier floods said that the aerial view on this last visit showed that it was undoubtedly a greater catastrophe than had originally been thought, and that massive external assistance was required.

Although the exact scope of the devastation will not be known until after an in-depth assessment, it appears quite impossible for the national Government to carry alone the enormous burden of providing relief assistance to the survivors. The Government has mounted a massive relief assistance programme, making use of practically all the scarce resources available in the country. A Relief Co-ordination Committee, under the chairmanship of the Prime Minister, has been established, and both civil and military authorities have been working together to help survivors. A round-the-clock relief operation is being carried out. Certain factors, such as bad weather - usual at this time of year - and isolation have made provision of relief difficult, particularly in remote areas and some of the offshore islands.

The Government's estimate of survivors in immediate need of drinking water and dry, ready-to-eat food, is well over two million, and the total affected population, many of whom have been made homeless, is calculated to be ap-



D. MACCLEAN Photo

International relief gradually built up as local food stocks were used for immediate needs.

proximately 9.8 million people. The cyclone struck towards the end of the harvest season. A bumper crop had been expected in the area, but the wind and salt water have caused substantial damage to standing crops and agricultural land.

Due to the height of the tidal surge, most of the houses on affected islands and in the coastal districts have been washed away or severely damaged. Heavy and extensive damage has been inflicted not only to the harvest but to property, livestock and infrastructure.

Preliminary figures on the extent of the disaster, released by the Government of Bangladesh in the second week of May showed over 138,000 dead, and an equal number of people injured; 780,000 homes totally destroyed; over one million livestock killed; 98,000 acres of standing crops lost and 600,000 acres damaged; hundreds of miles of roads and embankments washed away and thousands of boats lost. Almost 50,000 people were reported to be suffering from diarrhoeal diseases brought about by polluted waters and malnutrition. The Government



D. MCCLEAN Photo

Existing shelters could accommodate only 350,000 people.

has placed total damage at US \$1.4 billion. Drinking water, food and shelter for the survivors, as well as helicopters and "country boats" for the distribution of relief, were the most urgent requirements. In a second phase, replenishment of national food security reserves, which stood at 800,000 metric tonnes, restoration of the damaged infrastructure and rehabilitation of port and telecommunication facilities will be necessary.

Donor Response

Initially, the response of the donor community has been somewhat slow and insufficient. There are several reasons for this: first, no-one took an accurate and immediate measure of the impact of the cyclone, which struck the telecommunications and satellite tower in Chittagong, effectively cutting off communications between Dhaka, the capital, and the coastal belt. UNDRO started to issue limited information from 30 April, but in the first days following the disaster, little was known of the

extent of devastation or the needs of the survivors.

International relief has gradually built up while local emergency food stocks have been used for immediate needs. The World Food Programme (WFP), as well as the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), are active alongside the Red Crescent in efforts to meet immediate food and medicinal needs.

Several governments have made available a number of helicopters and boats to help in the relief effort. The Government of Switzerland has provided assistance in restoring telecommunications between Dhaka and the rest of the world. As of 15 of May, relief efforts have been considerably strengthened by a joint Bangladesh/United States Task Force, dubbed "Operation Sea Angel", including 7000 US Marines and dozens of helicopters and hovercrafts. The Task Force has distributed hundreds of tons of re-

lief supplies in both cyclone and flood-affected areas of the country. A British ship with Navy personnel and a relief team from the International Islamic Relief Organization also joined in the relief operations. Numerous Non-Governmental Organizations have been working in the affected areas.

The extent of the disaster has raised questions on the effectiveness of Bangladesh's early warning systems. In fact, early warnings were broadcast up to four days before the cyclone struck and Red Crescent volunteers had toured the threatened areas to alert the population. Shelters had been able to accommodate 350,000 people and three million other people had been moved further inland. However, the number of shelters is clearly insufficient and ways and means of persuading the threatened population to heed future warnings have to be investigated.

At a meeting, in Geneva, on 14 May, which brought together delegates from United Nations' Member States, Intergovernmental and Non-Governmental Organizations, and United Nations Agencies, the Co-ordinator announced the setting up, at the request of the Secretary-General, of an Inter-Agency Task Force to prepare, under his aegis, a consolidated and comprehensive report on the short and medium-term reconstruction and rehabilitation needs of Bangladesh. The report is being prepared in Dhaka by representatives of all relevant Agencies of the UN system under the chairmanship of the UN Resident Co-ordinator and in close co-operation with the Bangladeshi authorities, for presentation at the summer session of the Economic and Social Council, ECOSOC, in July 1991, in Geneva. ■

Earthquake and Floods in Afghanistan

On 1st February 1991, an earthquake measuring 6.8 on the Richter scale struck northern Afghanistan and Pakistan. In Afghanistan, more than one hundred people died and some 2,000 families were made homeless. During the following days, severe floods were reported in the Southwest of the country. 415 people died and 27,000 families were affected. At the request of the Government, UNDR0 issued an appeal for international assistance on 5 February.

This situation proved to be extremely complex for the national and international relief efforts, mainly because of difficult geographical and climatic conditions and of the political situation. Overall co-ordination for the earthquake victims was provided by the UNDP/UNDR0 Resident Representative in Kabul

and assistance to the victims of the floods was organized in co-operation with the Offices in Iran and Pakistan of the Co-ordinator for UN Humanitarian and Economic Assistance Programmes relating to Afghanistan (UNOCA). UNDR0 provided two logistics experts financed by the United Kingdom Government to UNDP Kabul. Task Forces, were set up in Pakistan, in Quetta and Peshawar, starting cross-border operations into Afghanistan, with the participation of

all United Nations agencies represented.

On 27 February, an UNDR0 delegate undertook a mission to Pakistan to strengthen co-ordination as flood relief operations from Pakistan gathered momentum to meet increasing needs. The work of the Peshawar Task Force, in the regions struck by the earthquake, was concluded by late February. By the end of March, all remaining relief activities in Pakistan had been taken

over by the Government and further involvement of the UN system was no longer required. Meanwhile, the workload of the Quetta Task Force and UNOCA Tehran for the floods affected region of southwestern Afghanistan increased considerably. One of the two UNDR0 consultants was assigned to a base in Afghanistan,



The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations
(Journal Le Monde)

*Victims
of flood damage*

Red Crescent Photo



close to the Iranian border, while the other one remained in Kabul. The floods, caused by unusually heavy and sudden rainfalls, further disrupted the infrastructure of canals, dams, and irrigation systems already damaged by twelve years of war. Losses in agricultural potential, the principal means of income for the population, were becoming a major concern. It is feared that the flood emergency could last for another two months, possibly leading to population movements into

neighbouring Pakistan.

The consequences of the disaster might also induce farmers to revert to the cultivation of poppies, which need little water, abandoning that of wheat which relies heavily on irrigation, thereby thwarting ongoing efforts of UN agencies to reduce drug production in the area.

The political situation calls for very complex logistics. Forwarding of relief goods from the support

base in Quetta necessitates considerable detours. Attempts to use direct roads are not likely to succeed as renewed fighting has been reported in recent weeks. Many roads are not serviceable, as bridges and fords have been destroyed by the recent floods. Communications between Kabul, Quetta, Islamabad, the relief teams and *ad hoc* bases are possible by radio only. UNDP, UNHCR, UNOCA and other agencies have a well established radio network but more equipment is required.

As the rehabilitation and reconstruction phase begins, it remains essential to continue prepositioning of relief supplies in the area. Considering the substantial volume of contributions and the complex structure of cross border relief operations, UNDR0 has extended its field delegate's stay in Afghanistan for another month. To ensure local co-ordination, the UNDR0 delegate will maintain close contact with UNOCA and with the UN Task Force in Quetta, handling logistics of distribution operations.



Flood damage to houses

OEP Photo

The Sanitary Revolution A Paradigm for Disaster Mitigation

Disaster mitigation means taking actions before a disaster to reduce the effects of natural hazards when they occur. The term "mitigation" applies to a wide range of policies and measures that can be instigated, from physical ones - such as the construction of stronger buildings - to procedural ones - such as the application of standard techniques for incorporating hazard assessment in land-use planning.

The 1990s are being devoted to a major effort to implement disaster mitigation techniques around the world. The United Nations has adopted the 1990s as the International Decade for Natural Disaster Reduction. The aim is to achieve a significant reduction by the end of the decade in loss of life and material damage caused by disasters. UNDRO and UNDP will play a central role in encouraging national governments and non-governmental agencies to initiate projects focussed directly on reducing the impacts of hazards and to routinely incorporate hazard awareness in development projects.

A useful analogy with the recently developing science of disaster mitigation is the implementa-

tion of public health measures that began in the mid 19th century. Before then tuberculosis, typhoid, cholera, dysentery, smallpox and many other diseases were major causes of death and tended to assume epidemic proportions as the industrial development of cities fuelled increasing concentrations of population. These diseases had a major effect on life expectancy, yet were regarded as just part of the everyday risks. The apparent randomness with which the diseases struck and the unpredictability of epidemics meant that superstition and a certain amount of fatalism were the public response to the hazards.

As causes of diseases and their propagation were increasingly understood, chiefly through the efforts of scientists and epidemiologists, so the incidence of epidemics and illnesses generally became demystified. It became evident that disease was preventable and gradually the concept of public protection against disease came into being.

In most parts of the world sanitation, purification of water supply, garbage disposal and public hygiene were recognized as key issues for

public health. The measures necessary to reduce the risk of disease were expensive - massive infrastructural investment was needed to build sewers and clean water supply networks - and required a major change in public practices and attitudes. Social historians refer to this as the "Sanitary Revolution". Garbage collection and disposal had to be organized. Throwing garbage or disposing of sewage in the streets became socially unacceptable. Personal hygiene, washing and individual sanitation practices emerged as important, initially encouraged by public awareness campaigns and gradually becoming part of the social norms and taught by parents to their children. Attitudes changed from the previous fatalism about disease to a public health "safety culture", where everyone participated in reducing the risk of communal disease.

Disasters today are seen in much the same way as disease was in the early 19th century: unpredictable and part of the everyday risk of living. Concentrations of people and rising population levels across the globe are multiplying the consequences of natural hazards which occur and increasing the risk of



ANSA Photo

Where and how people build affects the potential for disaster. Improved building techniques and better siting can greatly reduce the risks.

disasters. However, the 'epidemiology' of disasters - the systematic science of what happens in a disaster - shows that they are largely preventable. There are many ways to reduce the impact of a disaster and to mitigate the effects of a possible hazard or accident.

Just like the fight against disease, the fight against disasters has to be fought by everyone together and involves public and private sector investment, changes in social attitudes and improvements in the practices of individuals. Just as the sanitary revolution occurred with the development of a 'safety culture' for public health, so disaster mitigation has to develop through the evolution of an equivalent 'safety culture' for public protection against disasters. Governments can use public investment to build stronger infrastructure and create a safer physical environment to minimize

the occurrence of a possible disaster; but individuals also have to act to protect themselves. Just as public health depends on personal hygiene, so public protection depends on personal safety. The type of cooking stove an individual uses, and his awareness that a sudden earthquake could tip it over is more important in reducing the risk of conflagration than the community maintaining a large fire brigade. The type of house an individual builds, and the sites on which each individual builds his house, affect the potential for disaster in a community more than large engineering projects to reduce flood risk or landslide stabilization or sophisticated typhoon warning systems.

In each country and in each region, the types of hazards faced are different. Some countries are prone to floods, others have histories of

cyclone damage, and others are known to be in earthquake regions. Most countries are prone to some combination of the various hazards and all face the possibility of technological disasters as industrial development continues. The effects these hazards are likely to have and the damage they are likely to cause depend on what is present in the region: the people, their houses and the infrastructure. Each country is different. For any particular location or country it is critical to know the types of hazards likely to be encountered.

The understanding of natural hazards and the processes that cause them is the province of seismologists, volcanologists, climatologists, hydrologists and other applied scientists. The effects of natural hazards on structures and the man-made environment are the subject of studies by engineers and

vulnerability analysts. Death and injury caused by disasters and the consequences of damage in terms of the disruption to society and its impact on the economy is a research area for medical practitioners, economists and social scientists. The science is still relatively young - most of the recordings of damaging earthquakes by strong motion instruments were obtained in the past twenty years, for example, and only since satellite photography has it been possible to routinely track windstorms. The understanding of the consequences of failure on social organizations and regional economies is even more recent.

Understanding hazards involves comprehension of:

- *physical mechanisms of destruction*
- *causes of how hazards arise*

- *sources, probability of occurrence and magnitude*
- *consequences of harm*
- *the elements that are most vulnerable to their effects.*

Hazards have different effects on different parts of the community, sectors of the economy and types of infrastructure: floods tend to destroy agricultural produce but cause less damage to the structure of buildings; earthquakes tend to destroy structures but have little impact on crops growing in fields. The *vulnerability* of people, buildings, roads, bridges, pipelines, communications systems and other elements is different for each hazard.

The science of disasters is in a similar state of development to epidemiology in the latter half of the 19th century: the causes, mecha-

nisms and processes of disasters are becoming understood rapidly. As a result of this understanding, the more developed countries have begun to implement individual measures to reduce the risk of future disasters. Many techniques are known for disaster mitigation, and their relevance to the countries that need them most is now clear.

Disasters are very largely a developmental issue. The great majority of casualties and disaster effects are suffered in developing countries. Development achievements can be wiped out by a major disaster and economic growth reversed.

The promotion of disaster mitigation in the projects and planning activities of development protects development achievement and assists populations in avoiding needless injury.

Disaster Types and Mitigation Strategies

Earthquakes

Mechanism of Destruction: Vibrational energy transmitted to the earth's surface from depth. Vibration causes damage and collapse of structures, which in turn may kill and injure occupants. Vibration may also cause landslides, rockfalls and other ground failures, damaging settlements in the vicinity, trigger multiple fires, industrial or transportation accidents, and engender floods through failure of dams and other flood retaining embankments.

Main Mitigation Strategies: Engineering of structures to withstand vibration forces. Seismic building codes. Enforcement of compliance with building code requirements and encouragement of higher standards of construction quality.

Construction of important public sector buildings to high standards of engineering design. Retrofit strengthening of important existing buildings known to be vulnerable. Locational planning to reduce urban densities on geological areas known to amplify ground vibrations. Insurance.

Community Participation: Construction of earthquake-resistant buildings and desire to live in houses safe from seismic forces. Awareness of earthquake risk. Arrangement of building contents - sources of naked flames, dangerous appliances, etc - made stable and safe in prevision of possible ground shaking. Knowledge of what to do in the event of an earthquake occurrence; participation in earthquake drills, practices. Community action groups for civil protection; fire-fighting and medical knowledge. Preparation of fire extinguishers, excavation tools and other civil protection equipment.

Floods

Mechanism of Destruction: Inundation and flow of water with mechanical pressures of rapidly flowing water. Currents of moving or turbulent water can knock down and drown people and animals in relatively shallow depths. Debris carried by the water is also destructive and injurious. Mud, oil and other pollutants carried by the water can ruin crops and building contents. Flooding destroys sewage systems, pollutes water supply and may spread disease. Saturation of soils may cause landslides or ground failure.

Main Mitigation Strategies: Land-use control and locational planning to avoid potential flood plain being the site of vulnerable elements. Engineering of structures in floodplain to withstand flood forces and design for elevated floor levels. Seepage-resistance infrastructure.

Community Participation: Awareness of possible flood areas. Houses constructed to be flood resistant (water-resistant materials, strong foundations). Farming practices to be flood-compatible. Awareness of deforestation. Living practices reflect awareness: storage and sleeping areas high off ground. Flood evaluation preparedness, boats and rescue equipment.

Land Instabilities

Mechanism of Destruction: Landslides destroy structures, roads, pipes and cables either by the ground moving out from beneath them or by burying them. Rockfalls cause destruction from fragmentation of exposed rock faces into boulders that roll down and collide into structures and settlements. Debris flows in softer soils, slurry material, man-made spoil heaps and soils with high water content mean materials flow like a liquid, filling valleys, burying settlements, blocking rivers (possible cause of floods) and roads. Liquefaction of soils on flat land under strong vibrations in earthquakes is the sudden loss of the strength of soils to support structures allowing them to sink or fall over.

Main Mitigation Strategies: Locational planning to avoid hazardous areas being used for settlements or as sites for important structures. Reduce hazards where possible. Engineering of structures to withstand or accommodate potential ground movement. Piled foundations to protect against liquefaction. Monolithic foundations to avoid differential settlements. Flexible, buried services.

Community Participation: Recognizing land instability potential and identifying active landslides. Avoidance of siting houses in hazardous locations. Construction of good foundations for houses. Compaction of ground locally. Slope protection through terracing and forestry. Rockfall barriers (trees and earth banking).

Volcanic Eruption

Mechanism of Destruction: Gradual or explosive eruption, ejecting hot ashes, gases and dust. Blast pressures may destroy structures, forests and infrastructure close to the volcano and noxious gases may kill. Hot ashes fall for many kilometers around the volcano, burning and burying settlements. Dust may carry very long distances, and fall as pollutants on other settlements further afield. Molten lava is released from volcano crater and may flow for many kilometers before solidifying. The heat of lava will burn most things in its path. Snow-capped volcanoes suffer debris and mudflows from ice-melt that can bury buildings. A volcanic eruption may alter the regional weather patterns, and destroy local ecology. Volcanoes may also be sites of local ground upheaval during or independently of eruptions.

Main Mitigation Strategies: Locational planning to avoid areas close to volcano slopes being used for important activities. Avoidance of likely lava-flow channels. Promotion of fire-resistant structures. Engineering of structures to withstand additional dead loads of ash deposit.

Community Participation: Awareness of volcano risk. Preparedness for evacuation. Fire-fighting skills. Taking shelter in strong, fire and dust or gas - resistant buildings.

Windstorms

Mechanism of Destruction: Pressure and suction from wind, buffeting for hours at a time. Strong wind loads imposed on a structure may cause it to collapse, particularly after many cycles of load reversals. More common damage is building and non-structural elements (roof sheets, cladding, chimneys) blown loose. Wind-borne debris causes damage and injury. High winds cause stormy seas that sink shipping and pound shorelines. Extreme low air pressure at centre of a tornado is very destructive and houses may explode on contact.

Main Mitigation Strategies: Engineering of structures to withstand wind forces. Wind load requirements in building codes. Wind safety requirements for non-structural elements. Good construction practices and strong fixings. Micro-climatic siting of key facilities, e.g. in lee of hillsides. Planting of wind-breaks, planning of forestry areas upwind of towns. Provision of wind-safety buildings (e.g. strong village halls) for community shelter in vulnerable settlements.

Community Participation: Construction of wind-resistant houses or houses easy to rebuild. Secure fixing of elements that could blow away and cause damage or injury elsewhere, e.g. metal sheeting, fences, signs. Preparedness for storm action. Taking shelter in strong, wind-resistant buildings. Protection measures for boats, building contents or other possessions at risk. ■

Excerpts from "Training Module on Disaster Mitigation" published within the frame of the UNDP/UNDRO Disaster Management Training Programme. This Module was prepared by: A.W. Coburn, R.J.S. Spence and A. Pomonis.

UNDRO at Work

(March/April 1991)

RELIEF: MOBILIZATION AND CO-ORDINATION

■ MIDDLE EAST/PERSIAN GULF

On 12 April, the United Nations issued an emergency appeal for US \$400.2 million to address the needs of 1.5 million Iraqi refugees in Iran and Turkey. The appeal was launched at an Information Meeting for representatives of the international donor community, convened by the Disaster Relief Co-ordinator and attended by the High Commissioner for Refugees and by the Executive Delegate of the Secretary-General.

UNDRO continues to chair weekly meetings of the UN Inter-Agency Working Group for the Gulf crisis; to issue, in close co-operation with and on behalf of the High Commissioner for Refugees and the Secretary-General's Executive Delegate, Situation Reports on the progress of United Nations efforts in the region; and to report on the financial situation.

On 26 April, the Government of Japan announced a contribution of US \$82.5 million to UNDRO for assistance to the people affected by the aftermath of the Gulf crisis. This amount was in addition to US \$17.5 million already contributed by Japan in response to the appeal for US \$400.2 million. These sums will be allocated by UNDRO to the operational agencies involved, according to the framework set out in the Regional Humanitarian Plan of Action. In co-operation with UNDRO, Japan has organized several relief flights to Iran and Turkey.

As the number of refugees/displaced in Jordan and Syria has dwindled to a few hundred, the Senior United Nations Emergency Managers, SUNEM, appointed in those two countries during the emergency phase of the crisis have been recalled.

□ Relief Airlifts and Shipments:

In March and April 1991, UNDRO organized a number of flights from Tokyo to Iran, in co-operation with the Japanese Government, to transport five land cruisers and approximately 120 tonnes of relief goods donated by Japan (high protein biscuits, blankets and other relief equipment). A number of other flights, carrying a variety of relief items, were organized by UNDRO in late April from Tokyo to Incirlik, Turkey.

On 11 and 12 April, UNDRO also airlifted from its Pisa warehouse 37 tonnes and 35 tonnes of Japanese supplies to Tehran and Incirlik respectively.

Thanks to a contribution from the Swiss Government, UNDRO purchased five freezers, first aid mobile medical units, and generators for the camps in Iran close to the Iraqi border.

In close co-operation with the Italian Government, 14 tons of tents and blankets were airlifted by Italian Air Force planes from UNDRO's warehouse in Pisa, to Dyarbakir, Turkey, on 11-12 April, for the refugees from Iraq. The relief goods, valued at approximately US \$150,000, will be replaced by the Italian Government.

□ **UNDRO/Argentinian transport plane:** From 6 February, the Government of Argentina put a B.707 cargo aircraft at UNDRO's disposal to undertake relief airlift operations to and within the Gulf region. Over 25 flights were made on behalf of various Agencies/Governments including UNHCR, UNICEF, WHO LRCS, the Swiss Government, and the Japanese Government, up to 20 April.

In addition, the aircraft greatly facilitated the humanitarian missions on behalf of the UN Secretary-General, led by Mr. M. Ahtisaari and by the Secretary-General's Executive Delegate, Sadruddin Aga Khan, to Baghdad and Kuwait.

□ **Syria:** Following a request of the Government of Syria for the transportation of injured and sick people, displaced as a result of the Gulf crisis, UNDR0 purchased five ambulances which were despatched to Syrian hospitals in early March 91. This operation was made possible through a contribution from the Danish Government.

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■ **Afghanistan - Earthquakes/Floods:** Nine Situation Reports were issued by UNDR0 between mid-February and mid-April. (See article page 8).

□ **Earthquake:** The emergency phase, in the case of the earthquake, was declared over by 26 March.

□ **Floods:** As relief operations continued, UNDR0 dispatched one relief expert made available by the Swiss Disaster Relief Unit, to assist the UNOCA Office in Islamabad, responsible for flood relief co-ordination.

UNDR0 also extended the mission of one of its two field delegates in Kabul, to ensure local co-ordination. Total contributions reported to UNDR0 amounted to US \$7 million.

■ **Colombia - Cholera Threat:** Undro issued an information report, on the basis of information provided by WHO/PAHO and the UNDR0/UNDP Resident Representative. Most of the cases occurred in the southern Department of Narino, near the Ecuadorian border. A few cases were reported at the southern border with Peru and Brazil and in the central part of the country.

■ **Costa Rica:** Further to the earthquake which caused extensive damage to infrastructure and housing in the Northern parts of Costa Rica in late December 1990, the Government of Luxembourg contributed an amount of approximately US \$95,000, in early March, for the rehabilitation and reconstruction of several buildings (retirement home, school and orphanage). Part of this contribution will be used for the implementation of an earthquake mitigation project in the most affected province.

■ **Ecuador - Cholera:** UNDR0 monitored the evolution of the cholera threat, in close liaison with WHO/PAHO and the UNDR0/UNDP Resident Representative.

Following an urgent appeal from the Government, UNDR0 obtained cash contributions from the United Kingdom and the Netherlands in order to take initial steps to control the spreading of the disease. Thanks to these contributions and to an effective control system put in place by the authorities, most of the cases were confined to the foci of the disease in the southern province of El Oro.

UNDR0 issued Information Reports on this emergency.

■ **Malawi:** In regard to the extensive flooding and a landslide in the Phalombe region of southern Malawi, UNDR0 launched an appeal for international assistance on 21 March.

A UN inter-agency assessment mission, led by an UNDR0 Relief Co-ordination Officer visited the area on 23 March and drew up a list of unmet needs, which was presented to a Government/Donors/NGO Committee. In response, relief goods financed by the Government of Japan were flown from UNDR0's warehouse in Pisa, and the Office provided an emergency grant.

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■ MOZAMBIQUE

□ **UNDR0 Stockpile:** With the assistance of the Swiss Government, the construction of a warehouse in Beira, Sofala province, has been finalized. It will allow for quicker delivery of emergency relief items to affected population in the region. Another warehouse in Maputo was completed earlier this year. Both are managed in co-operation with the Mozambican Government.

□ **Emergency operations in Sofala province funded by EEC:** A UN mission to the areas of Caia and Chibabava, which are accessible only by air, identified an affected population of some 26,000 who had last received food assistance in January 1990. Due to lack of rains during the first planting season almost all crops had been lost. It was decided to send seeds for the second planting season and emergency food rations for severely malnourished children. The immediate launching of the operations was made

possible by the EEC which granted a cash contribution of some US \$260,000.

An UNDRO-leased airplane funded by the Government of Canada, continued to carry relief personnel to various provinces. A total of 90.4 hours were flown in January and February, completing eleven missions.

□ **Documentary:** Thanks to a contribution from the Italian Government, a film depicting aspects of the emergency is being produced. A mission to shoot footage in Mozambique has been completed. The documentary is expected to be available this Summer.

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■ PERU

□ **Drought Emergency Programme:** In 1989-1990, 1.3 million Peruvians, mainly small peasants and pastoralists, had been victims of a severe drought. Following a request from the Government of Peru and of an UNDRO-led inter-agency mission including FAO, WHO/PAHO UNICEF and WFP, the Secretary-General of the United Nations issued an international appeal on 8 June 1990 for a drought emergency programme. This programme was concluded suc-

cessfully in March 1991. UNDRO's last situation report on this emergency listed international assistance received by Peru (over US \$36 million from 19 countries, EEC and non-governmental organization).

□ **Earthquake:** Eight seismic shocks measuring between 4.5 and 6.2 on the Richter scale hit the provinces of Moyabamba and Rioja in the north-eastern cholera-stricken department of San Martin, from 4 to 8 April 1991.

UNDRO issued two situation reports including a request for international assistance for the provision of shelter materials, blankets, water purification tablets and medical supplies.

□ **Cholera Epidemic:** Cholera continued to spread throughout Peru in March and April 1991. Following the appeal of 14 February 1991, UNDRO, in close co-operation with WHO/PAHO, issued several situation reports on the evolution of the disease, the measures being taken by the Government to limit the death toll, and the international assistance provided by Governments, the EEC, the United Nations system and non-governmental organizations.

The Government of Ireland contributed 20,000 Irish pounds, through UNDRO.

DISASTER MITIGATION

■ **Pan-Caribbean-Meeting on National Disaster Co-ordinators:** The eighth meeting of National Disaster Co-ordinators took place in Saint Lucia from 18 to 20 March 1991. It was also the final meeting of NDCs in the context of the Pan Caribbean Disaster Prevention & Preparedness Project (PCDPPP). The UNDRO representatives to the meeting introduced a proposal for a successor project to the PCDPPP, the Caribbean Disaster Management Programme (CDMP). Initially planned for five years, the CDMP will strengthen the disaster mitigation capacity of individual countries on the basis of the achievements of the PCDPPP. UNDRO's proposals were broadly endorsed by the National Co-ordinators and reflected in the report on the meeting.

■ **Egypt:** From 28 February to 7 March 1991, UNDRO undertook a mission to Egypt to participate in the steering committee of an UNDP/UNDRO project

on disaster management planning. The mission assessed the results of the UNDP/UNDRO project initiated in 1988 and due to be completed by the end of 1991. At a training course of the Academy of Scientific Research and Technology, attended by 70 participants from all over the country, the UNDRO delegates delivered several lectures on industrial hazards assessment and disaster management.

■ **Madagascar:** In February 1991, UNDRO prepared a technical report on "Analyse des Catastrophes Naturelles à Madagascar - Stratégies Conseilées, et Proposition du Projet". Based on the example of cyclone "Alibera" (January 1990), the report analyzes local building techniques and formulates recommendations on the appropriate strategies for reducing damage. It is part of an UNDRO/UNDP project for the strengthening of governmental intervention capacities in case of disasters (mainly cyclones), which

recommends the extension of the project to cover the southern part of the country, where natural hazards are of a different nature (deforestation, desertification and land erosion.) The report has been presented to the governmental authorities concerned.

■ **USSR:** UNDRO received two requests from the USSR State Commission for Emergency Situations and the USSR Academy of Sciences, to undertake multisectoral studies on disaster management planning for several seismically vulnerable areas in the country, namely the metropolitan area of Petropavlovsk-Kamchatsky in the Kamchatka peninsula; the metro-



Simulation of earthquake intensity in the Dushanbe area.

politan area of Dushanbe (the capital of the Tadjik SSR); the city of Nurek and the Nurek dam; and the Sarez landslide-created dam. Water infiltration through the landslide-created dam is increasing alarmingly. UNDRO is looking for funding and is preparing a team of consultants in economic and vulnerability analysis, seismic and water hazards management, disaster scenario compilation, safety of water retaining structures, slope stability, disaster awareness and public training. In 1990, UNDRO prepared an all-hazards-approach management planning study for Armenia. The study was considered a valuable contribution to the disaster management planning process at the national and regional level.

■ **SASAKAWA Award:** The recipient of the fifth Sasakawa/UNDRO Award for disaster prevention was selected on 2-3 May 1991. (See article page 18). The Jury Committee included Professor Otton Lara Montiel, Adviser to the Vice President of Ecuador; Mr. Stefano Canavesio, Adviser to the Ministry of Civil Protection of Italy; Mr. Sadok Znaidi, Secretary-General of the International Civil Defense Organization; Professor Muhammad Shamsul Huq, the Former Minister of Foreign Affairs of Bangladesh; and Commodore C.J. Littleton, Director General of the Natural Disaster Organization of Australia who represented respectively the African, the American, the Asian, the European, and the Oceanian Regions. Documentation submitted by each of the 18 candidates had earlier been sent to Jury Members for scrutiny.

INFORMATION, COMMUNICATIONS, EXCHANGE OF VIEWS AND CONTACTS

■ **16th Inter-agency Procurement Working Group:** An UNDRO representative took part in the 16th IAPWG, in Copenhagen (Denmark) from 3 to 5 April 1991. This annual meeting brings together the Chiefs of Procurement of the U.N. family and of various services from New York Headquarters. Discussions focused on a review of IAPSO's (Inter-Agency Procurement Services Office) activities in 1990, including the publication of various supplier catalogues and standardization of items. A catalogue of relief equipments is being drafted, in close co-operation with UNDRO. New computer technology for the registration of suppliers of more general material was introduced and will soon be experimented in UNDRO. Telecommunications and Global Insurances Schemes were also discussed.

■ **International Directory of Search and Rescue Teams:** In response to a request from the Third Meeting of Officials in charge of National Emergency Relief Services (NERS), UNDRO is developing a directory of qualified SAR teams. To allow the systematic registration of such teams, questionnaires were sent to 57 countries. By the end of April 1991, replies had been received from Australia, Canada, Ecuador, Finland, Indonesia, Italy, Jamaica, Japan, Pakistan, Poland, Singapore, Sweden, Tunisia, Turkey, United Kingdom and the United States of America. This information is now being processed. A letter of reminder was sent inviting those countries that had not yet replied to do so by 24 May 1991, so that their teams

(Continued on page 25)

"Wings of Hope" Award goes to UN Disaster Relief Co-ordinator

The Association for International Migration of the United States, USAIM, presented its first annual "Wings of Hope" Award on 16 April 1991 to United Nations Under-Secretary-General and Disaster Relief Co-ordinator, M'hamed Essaafi, in recognition of his work and that of UNDRO in co-ordinating the relief efforts of UN Agencies on behalf of the displaced persons and evacuees from Iraq and Kuwait as a result of the Gulf crisis.

Mr. James N. Purcell, Director-General of the International Organization for Migration (IOM), which was called upon by UNDRO to carry out the repatriation of third-country nationals to their countries of origin, was also honored by USAIM.

USAIM is a U.S. private sector charitable organization devoted to projects to assist refugees, migrants and displaced persons, and to providing additional funding for the

work of IOM, its sister organization.

The award was presented at a benefit reception in New York City, hosted by the Chase Manhattan Bank. The proceeds of the benefit reception were intended to meet the needs of the victims of the Gulf crisis and other similar emergencies. In co-ordination with USAIM, New York Mayor, David Dinkins declared April 16 "Refugees Day" for his city.

Sixth SASAKAWA/UNDRO Disaster Prevention Award goes to Italian Volcanologist

Professor Franco Barberi, President of the National Volcanic Group of Italy, was selected from among 19 candidates as the 1991 laureate for the Sasakawa/UNDRO Disaster Prevention Award in recognition of his distinguished activities in disaster prevention and preparedness.

The five-member international Jury, from Africa, Asia, Australia, Europe and Latin America, which met on 2 and 3 May at the Headquarters of the Office of the United Nations Disaster Relief Co-ordinator, stressed Prof. Barberi's leading role in volcanic disaster mitigation. For many years Prof. Barberi has

assisted a number of developing countries in promoting improved scientific monitoring and public awareness of volcanic hazards, helped launch activities contributing to technological innovations in disaster prediction and contributed significantly to scientific research oriented to the mitigation of volcanic disasters.

An Italian national, Prof. Barberi was born in 1938. He holds the chair of volcanology at the University of Pisa and is a member of several scientific commissions and foundations. Last year, Prof. Barberi was appointed by the Secretary-General of the United Nations

as a member of the UN Scientific and Technical Committee for the International Decade for Natural Disaster Reduction.

In the opinion of the Jury, Prof. Barberi's achievements and research best exemplified the type of activities which the Sasakawa/UNDRO Disaster Prevention Award is intended to encourage. The Award, which carries a prize of US \$45,000, was created in 1986 and endowed by Mr. Ryoichi Sasakawa, President of the Japan Shipbuilding Industry Foundation, for outstanding achievements in the field of disaster prevention and preparedness. ■

US \$415 Million Appeal for United Nations Aid Programme for the Persian Gulf Region

An appeal for US \$415 million in additional contributions to the United Nations' humanitarian relief programme relating to Iraq, Kuwait and Iraq/Turkey and Iraq/Iran borders, was issued on behalf of the Secretary-General, on 15 May.

At a high-level meeting with representatives of the international donor community, the Executive

Delegate of the Secretary-General, Prince Sadruddin Aga Khan, presented an updated and consolidated appeal that took into account earlier contributions and superseded all previous appeals for the region. The meeting, chaired by the United Nations Disaster Relief Co-ordinator, brought together the executive heads of principal United Nations Agencies concerned: the High Commissioner for Refugees, the Execu-

tive Director of UNICEF, the Executive Director of the World Food Programme, the Assistant Director General of the World Health Organization, and a senior representative of the UN Development Programme, as well as the Deputy Director-General of the International Organization for Migration. The Executive Delegate of the Secretary-General stressed the urgency of the needs and the importance of



From left to right: Prince Sadruddin Aga Khan, Executive Delegate of the Secretary-General; Mr. M'hamed Essaafi, UN Disaster Relief Co-ordinator; and Mrs. Sadako Ogata, High Commissioner for Refugees.

flexibility on the part of donors to enable the United Nations to make the best possible use of donated funds. "Unless we can make use of contributions on both sides of the border, the United Nations operations will be seriously handicapped", he said.

Prince Sadruddin Aga Khan made a comprehensive report of the situation in the various countries covered by his mandate and of United Nations action to date. One month ago, he said, 600 people, mainly children, were dying every day in the mountains as they fled from Iraq into Iran and Turkey. Now, no one was dying anymore on the hill-tops. The bleak mountain-top camp of Iskiveren, on the Turkish border had been virtually emptied and, with the opening of a United Nations Humanitarian Centre in Zakho, Iraq, and World Food Programme food-aid distributions in several towns of northern Iraq, some 200,000 refugees had already come down from the Turkish border to return home. The International Organization for Migration was providing transport, dubbed as the "blue shuttle", for thousands of returnees at a cost of no more than US \$1.6 per person. Since 13 May, at the request of both the Iraqi authorities and concerned Member States, the United Nations High Commissioner for Refugees had formally taken over responsibility for the transit centre of Zakho and her Office would be managing other camps in the region.

The Executive Delegate underscored the fact that the Iraqi authorities welcomed and gave their full support to all United Nations operations aimed at facilitating urgent humanitarian assistance and the voluntary return home of the refugees, and said that United Nations agencies and Non-Governmental



The document presented at the meeting provided a breakdown of immediate needs

Organizations were working hand-in-hand, as one team, to alleviate the plight of the people. The needs of vulnerable groups in Iraq as well as preventive measures for health and nutrition should not be forgotten he added. He had overflowed a number of cities in the South which he described as "floating in a sea of garbage", because of the destruction of the infrastructure, posing serious health hazards to the communities.

The problem of the massive caseload of refugees still in Iran (approximately 1.3 million of which an estimated 80,000 had started to return home) continued to be serious, Prince Sadruddin said. The High Commissioner for Refugees, Mrs. Sadako Ogata, pointed out that Iran was at present spending US \$10 million a day for the refugees, and that much more help from the international community was needed.

For Kuwait, the Executive Dele-

gate highlighted the urgency of the environmental and health-related aid requirements as well as the plight of the displaced persons.

The document presented at the meeting provided a breakdown of immediate needs: US \$300 million for refugee and repatriation projects, including close to US \$65 million in food aid; US \$43 million for emergency assistance to vulnerable groups in Iraq; US \$64 million for short-term emergency assistance to Iraq; and US \$7.6 million for environmental and health-related assistance to Kuwait. In this respect, Mr. M'hamed Essaafi, the UN Disaster Relief Co-ordinator convened a "donors' working meeting" on 21 May.

In his remarks Mr. Essaafi stressed that UNDRO would continue to provide co-ordination support for the United Nations action, in particular through the weekly inter-agency meetings in Geneva. The Executive Director of UNICEF,

Mr. J. Grant, indicated that lack of funds had so far prevented UNICEF from shipping a US \$3.5 million consignment of essential drugs which was ready for despatch. Mr. J. Ingram, Executive Director of WFP, called on donors to provide preferably cash aid and not just food aid to ensure greater flexibility in meeting the needs of the affected people.

Dr. R. Henderson, Assistant Director-General of WHO, expressed the readiness of his organization to support the operations of the UN system, in the health sector, under the leadership of the Executive Delegate. A number of delegates attending the meeting took the floor to ask for additional clarifications on the programme.

In conclusion, Prince Sadruddin noted that international assistance provided so far had not matched the magnitude of the crisis. "If you want the United Nations to deliver, [...] to contribute to global solutions, then strengthen the UN; give it the wherewithal to carry out the task with which you have entrusted it". ■

***Address by Mr. M'hamed Essaafi,
the United Nations Disaster Relief Co-ordinator,
to the Inaugural Session of the Scientific
and Technical Committee of the International
Decade for Natural Disaster Reduction
(Bonn, Germany, 4 March 1991)***

I am addressing you today at a time when the world community is facing yet another humanitarian challenge of extreme magnitude. The hostilities in the Gulf have come to an end, and although we experience a feeling of relief and look with hope towards a process of establishing a just and lasting peace in the region, we are at the same time daunted by the severe impact which the conflict has inflicted on the civilian populations. As we are preparing for large scale humani-

tarian assistance to innumerable victims and envisage efforts in the field of reconstruction that are difficult to imagine, we are well aware that, whilst material damage can be coped with over time, there is no valid remedy for human losses and suffering.

We are facing this situation after having executed an assistance programme for the displaced persons in the affected area over the last seven months which has already

become one of the largest relief operations in recent history. Co-ordinated by UNDRO, and on the basis of constant consultations within a United Nations Inter-agency Group in Geneva, contingency plans have been drawn up which we will adapt in a concerted effort in order to meet the challenge.

In spite of these considerable relief activities during the Gulf crisis, international attention has focused on the United Nations primarily in

the context of political crisis management, indeed an essential part of its *raison d'être*. Now, however, the United Nations' equally important humanitarian function will be highlighted again, and will be looked upon with greater expectations than ever.

The world has moved through extraordinary changes during the last years; a process of peaceful and constructive global development has been set in motion - politically, economically and ecologically. Irrespective of the threats that we continue to face, this process must be pursued vigorously in order to ensure a safe future for our planet.

I welcome, therefore, the opportunity to participate in this inaugural meeting of the Scientific and Technical Committee of the IDNDR. In view of the current predominance of post disaster considerations, and the political aspects of emergency management, it seems to me more pertinent than ever to draw the attention of all concerned to the positive potential that exists for the reduction of risk through preventive action. The philosophy of the IDNDR, and its conviction that protection against the impacts of disasters can be achieved through forward planning, provides an important message. Even if limited to natural disasters it sets the right signs with regard to all types of hazards and stands out as an encouraging example based, as it is, on a unanimous global consensus.

Referring to the support the Decade has received I would like to pay tribute to our German hosts, who have not only provided a perfect environment for this meeting, but who have also been among the

most ardent participants, already in the early stages of the Decade's preparatory phase. The Federal Republic of Germany has contributed conceptually and politically within the various fora concerned, has been among the first to initiate a National IDNDR Committee and has matched these activities with substantive financial support. I am particularly grateful in this respect to the Foreign Minister, Mr. Genscher, for his positive references to the goals and objectives of the IDNDR during the 44th and 45th United Nations General Assembly.

Germany has also been among those Member States that have pointed strongly to the need for a timely implementation of the Decade's mechanism as outlined in IDNDR's founding resolution. In fact, all participants as foreseen in the Decade's organisational framework have been looking forward particularly to the establishment of the Scientific and Technical Committee.

This body specifically represents the concept of a concerted multisectoral approach to the issue of disaster reduction by linking research, applied science, technology and the operational knowledge in disaster management with the implementing actors at all levels. Consequently, the General Assembly has charged the Committee with an ambitious and far-reaching task, namely to provide the international disaster management community with guidance and advice on an overall work-programme within the IDNDR and to assist in the evaluation of the Decade's success.

For UNDRO, the Scientific and Technical Committee is an extremely

important partner. Disaster mitigation, that is alleviating the effects of disasters through forward planning and the implementation of concrete preventive measures, has been one of the two pillars of UNDRO's mandate since its inception. We have greeted the IDNDR with satisfaction and expectations. On the one hand, the Decade represents recognition for that part of our mandate which has never been highly visible and as such has demanded considerable dedication of UNDRO and its partners in order to achieve even limited progress. On the other hand, the IDNDR presents an ambitious challenge for the future. We now see the opportunity to build our efforts in this field on a broad international consensus as well as a substantive commitment of recipient and donor countries alike to accord priority, and resources, to this issue. We believe, therefore, that by stepping up our disaster mitigation activities in number and in an innovative way, we will meet with a receptiveness that promises visible success and ensures the firm integration of disaster mitigation into national development planning.

We are currently working together with a number of the Scientific and Technical Committee's members in various projects and have been doing this successfully over a long time in the past. I still cherish the fruitful intellectual exchange with the Decade's *ad hoc* Group of Experts which had already provided beneficial input into our work. I am, therefore, convinced of an equally excellent and constructive co-operation between UNDRO and the Committee. As for UNDRO, I can pledge unceasing support.

Mitigating Natural Disasters

Natural disasters are part of the environment in which we live. They do not discriminate between people or countries. And yet, no disaster is entirely *natural*. Human activity invariably aggravates the risks through insufficient attention to where and how settlements are built, or natural resources are exploited. Disasters are, therefore, complex events; and the problem of disaster prevention and mitigation has many facets. "Mitigating Natural Disasters", A Manual for Policy Makers and Planners, published by UNDRO (1991), sets out to demystify the scientific and technological aspects of disaster mitigation. Although the Manual has been written with the developing countries mostly in mind, it would be incorrect to suggest that the developed countries could not learn from such a study, especially at the regional and local levels.

Among those who have responsibility for what one may broadly call *disaster mitigation*, not everyone agrees on the priorities or even on what the subject is mainly about. This study addresses an aspect, or segment, of the disaster mitigation spectrum that has received little coherent attention outside a highly specialized scientific group: risk assessment and reduction through structural and non-structural physical measures as a function of the hazard(s) involved.

Those who have prepared this

study have long been convinced that the physical aspects of disaster mitigation have been shunned by a significant proportion of the disaster management community, largely because of the mental blockage caused by the need to master, at the outset, a number of fundamental principles in earth sciences and engineering. Yet the scientific principles involved are no more difficult to grasp than basic principles in any other discipline. Much of the challenge, therefore, resides in how knowledge is reformatted (to use a computing analogy) and presented to the lay user.

Disaster managers face many conflicting convictions, prejudices and beliefs. On the one hand, scientists (including engineers) tend to make two assumptions: first, that a scientific explanation of the underlying phenomena causing disasters suffices to provide the basis for preventing further disasters from occurring; second, that what is self-evident to the scientist or engineer must be self-evident to everybody else.

On the other hand, those who work in the social and humanitarian domains tend to believe that disaster management is essentially a matter of social management and policy formulation, and that pre-disaster planning relates predominantly to preparedness. Quantifiable technical issues are often seen as by-prod-

ucts. One might also add a further category: those to whom disaster management is synonymous with development policy, to the extent that disaster management becomes a substitute for development.

A further observation may be made as a corollary: the topics or subject areas concerned with disaster mitigation have been either too compartmentalized, too hermetic (e.g. hydrology, seismology, meteorology, civil engineering, etc.), or too diffuse, covering broad policy issues on disaster management, relating largely to relief and rehabilitation.

None of the assumptions made by the various groups mentioned above are necessarily false, but alone they do not suffice. At some point, science, technology and society must meet. Disaster mitigation undoubtedly must comprise a spectrum of complementary measures in the social, economic, political, scientific and technical fields.

"Mitigating Natural Disasters" is a Manual intended as one of many disaster-management tools. It does not pretend to act as a substitute for other standard works or methods in disaster mitigation or management, and should not be seen to do so. It should be examined on its own merits. The question we beg the reader *not* to ask is: should we not rather have a disaster prepared-

ness manual, or a general policy manual instead? Work in these fields exists and continues to flourish. What we are attempting to do is fill a gap in the disaster mitigation spectrum.

The Manual addresses, on the one hand, a tangible segment of the disaster mitigation spectrum, namely the control and reduction of the physical damage caused by sudden and violent natural phenomena (floods, cyclones, earthquakes, volcanoes and landslides); and on the other, presents this segment of the spectrum in such a way that it will be of the widest possible interest to disaster managers at the technical, professional, administrative and policy-making levels. The exercise consists in adapting scientific and technical knowledge to the needs of users who are not scientists themselves but who need to understand the physical parameters of disasters in order to decide, plan and implement mitigation measures, especially at the sub-regional and local echelon.

Finally, it should be emphasized that the Manual is not only a methodological guide, but also a practical guide on information-gathering and management to apply to the parameters described. The Manual is perhaps, above all else, a training tool in disaster risk assessment and reduction for professionals, policy-makers and managers.

It is recognized that disasters are not strictly-speaking "natural". The agency of man is also a determining factor. However, the term "natural" has been used for convenience as opposed to industrial, chemical, environmental and other man-made disasters.

The Manual differs from previ-

ous studies on comprehensive disaster mitigation in that it has systematized the technical spectrum of disaster risk assessment as a whole, albeit within a policy framework. This has been done using a "science for the layman" approach, the end-user being kept very much in mind.

The method adopted is thematic and corresponds to the logical sequence in which the various disciplines engaged in mitigation would normally work: identifying the type of natural hazard involved and assessing its probable frequency of occurrence for different magnitudes of event (the "phenomenon"); assessing how vulnerable the built environment is under such conditions (the "structural effects"); estimating how damage can be expected (the "socio-economic effects"); and adopting the appropriate techniques and measures to reduce human and material losses in the future (the "options"). The above sequence is more popularly known as "the hazard, vulnerability, and risk analysis sequence". It serves to satisfy the need of each profession for recognition.

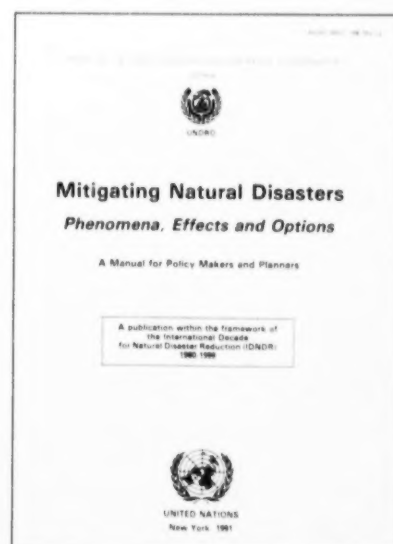
The study ends where implementation begins, for at that point we are already in the field of conventional planning practice. However, if at this stage one were to address the question of implementation strictly from a disaster management point of view, one would have to revert to the drafting of specific national policies, and to take actual, local conditions into account. As mentioned above, the Manual opens the door to training and implementation for policy makers and planners. Indeed, the next step for the United Nations system, Governments and non-governmental agencies is to use this Manual as

a training tool. The Manual can be adapted to the needs of communities, in that the method remains constant but the inputs are obtained at the neighbourhood and even individual site levels.

It is hoped that this Manual will be of service to those responsible for disaster mitigation. UNDRO appeals to potential users to contact the Organization and provide it with their comments, suggestions and requests. UNDRO stands ready to respond to the users' needs, especially in the developing countries.

"Mitigating Natural Disasters - Phenomena, Effects and Options - A Manual for Policy Makers and Planners". Published by the Office of the United Nations Disaster Relief Co-ordinator (March 1991). Copies are available from the Distribution and Sales Section, United Nations at New York or Geneva. UNDRO/MND/1990 Manual - Sales No. E.90.III.M.1, Price US \$30.

Note: This Manual was made possible thanks to a generous grant from the Government of the Kingdom of the Netherlands, Ministry of Foreign Affairs.



UNDRO at Work

(Continued from page 17)

could be included in the first edition of the Directory. A presentation, on the purpose of the Directory and the criteria used to identify the teams, was made at the recent International Workshop on Search and Rescue, held in Austria, from 8 to 12 April 1991.

■ **UNDRO's Warehouse in Pisa:** The Chief of UNDRO's Administrative Unit undertook a two-day mission to Pisa, Italy, from 22 to 23 April to review administrative and financial matters relating to UNDRO's warehouse. Organization and functioning of airfreight operations as well as replenishment of relief goods were on the agenda.

■ **Visitors:** Visitors to UNDRO headquarters in Geneva during the months of March/April included:

Mr. V. Kravchenko, Minister of Foreign Affairs, accompanied by the Permanent Representative to the UNOG of the Bielorrussian SSR (Ambassador A. Mardovitch); Mr. I. Tirpak, Minister of Environment, accompanied by the Permanent Representative to UNOG of Czechoslovakia (Ambassador J. Kralik); Mr. J. Bolton, Assistant Secretary of State for International Organizations Affairs, Department of State, accompanied by the Permanent Representative to UNOG of the USA (Ambassador N.B. Abram); Ambassador D. Lyman, Director of Refugees Programme, Department of State, USA; Mr. I. Holderbaum, Head of Humanitarian Assistance, Foreign Affairs Ministry, accompanied by the Deputy Permanent Representative to UNOG of Germany; Mr. Andrea Borruso, Under-Secretary-General, Foreign Affairs Ministry, Italy; Ambassador A. Semichi, Permanent Representative to UNOG of Algeria; Dr. Y. Uki and Dr. Ninomiya from the Ministry of Health, Japan; Mr. P. Laffeur, Ministère des Relations Internationales Gouvernementales, Quebec, Canada; Mr. Inoue and Mr. Kimura from the Prime Minister's Office in Japan; Mr. E. de Maio, Responsable de l'Aide humanitaire, Ministère des Affaires Etrangères, Italie; Mr. S. Zulficar, Directeur de la Division des sources de financement et chef du Task Force pour le Golfe, UNESCO, Paris; Mr. G. Bradford, Assistant Director/OFDA for Operation Programmes, USA; Mr. S. Van Voorst Tot Voorst, Coordonateur de l'aide humanitaire des Pays Bas;

The Resident Co-ordinators in Iran and Turkey and the UNDP Resident Representatives in Barbados and Cyprus visited UNDRO to provide first hand information on the situation in the countries where they serve, and to be briefed on the activities of the Office.



Inside view of the Pisa Warehouse

UNDRO Warehouse in Pisa

Goods donated by the Governments of Finland, Italy, Japan and Norway

Blankets	Plastic pails
150X200 cm (80% wool)	Generators
150X210 cm (50% wool)	(4 kva)
150X220 cm (60% wool)	(6.5 kva)
	(12 kva)
Tents	Trailers for generators
(12.5 m ²)	Transformers
(24 m ²)	Extensible cables (50 m)
(32 m ²)	
(43 m ²)	Kitchen sets
(46 m ²)	Family kits
(240 m ²)	
Plastic water tanks	Mallets
(3,000 l)	Pickaxes
(3,500 l)	Saws
(7,500 l)	Shovels
Jerrycans (15 l)	Spades
	Nylon rope (reels 200 m)
Tarpaulins (24 m ²)	Thermic containers
Plastic sheeting	
(365 m ²)	
(400 m ²)	NBC Protection clothing

A kitchen set is composed of various cooking and table utensils.

A family kit includes a kitchen set, two jerrycans, various hand tools, a petroleum lamp, matches, soap and water purification tablets.

For further details and information on availability of goods in stock, please call
UNDRO Geneva 7346011 - Ext.: 3290.

Tampere Conference on Disaster Communications

An International Conference on Disaster Communications is going to be held in Tampere, Finland, from 20 to 22 May 1991. The Conference is organized by the International Institute of Communications, in association with UNDRO, the International Telecommunication Union, the League of Red Cross and Red Crescent Societies and UNHCR, and with major support from the Aamulehti Group of Finland and the Annenberg Washington Programme in Communications Policy Studies at Northwestern University.

The International Institute of Communications considers this conference to be a further substantive step in the process begun by UNDRO at its Geneva Conference on Disaster Communications in March 1990.

The three-day Tampere meeting is bringing together emergency/disaster relief and related agencies and a range of communications groups involved in Telecommunications, Broadcasting, Radio Communications, Satellite Transmissions and the Press. As the International

Decade for Natural Disaster Reduction (1990-2000) sets underway, the conference is preparing the framework for an international communications and disaster management information network which includes a rapid response capacity.

A draft declaration, based on the major needs identified and endorsed by the UNDRO Geneva Conference, is to be reviewed by the Tampere meeting aiming at its eventual adoption by the UN and other appropriate bodies. The declaration addresses inter alia, specific areas in emergency response management which should be improved in order to facilitate the dissemination and use of telecoms, satellite (especially remote sensing) and broadcasting technologies in the disaster context.

While reiterating UNDRO's focal point role for the co-ordination of the activities proposed by the draft Declaration, it emphasizes the principle of national sovereignty, a guiding basis of IDNDR, which primary responsibility for disaster protection lies with national governments.

Apart from reviewing a final draft of the declaration, the Tampere conference will feature addresses by Pekka Tarjanne, Secretary-General of the International Telecommunication Union (who will chair the meeting), Par Stenback, Secretary-General of the League of Red Cross and Red Crescent Societies, and M'hamed Essaafi, Under-Secretary-General, United Nations Disaster Relief Co-ordinator. The meeting will also hear an address by the International Maritime Satellite Consortium on Transborder Use of Land Mobile Earth Stations.

In addition, conference segments will include presentations (including audio-visual) on operational aspects of new applications of communications technology in the disaster relief and preparedness sector from a user perspective; remote sensing satellite uses; broadcast Communications Interaction with Disaster Management; private/industrial sector participation. Latest examples of relevant communications technology by service providers will also be displayed.

■

Conferences

International Civil Defence Organization (ICDO) - Courses 1991

Geneva, Switzerland 24 June - 12 July

Lahore, Pakistan, 23 November - 12 December 1991

The courses organized by ICDO are intended for those who carry out responsibility tasks at the management level, and need training in the field of prevention, disaster relief operations, emergency services and public health, as well as practical training on the use of Civil Defence equipment. They are open to instructors and senior Civil Defence personnel of ICDO member States. Candidates from non-member States may be admitted. (Courses will be given in English).

■ The Geneva Course will deal with the essential elements of the various different Civil Defence techniques and technologies: management of natural or technical disasters, fire-fighting, rescue, first aid, study of the materials and equipments, transmission, organization and functioning of Civil Defence centres. It will take place at the *Centre de la*

Protection civile de Genève, in Bernex. Closing date for applications: 15 June 1991.

■ The Lahore Course will deal with health problems in emergencies and epidemics, emergency rescue, organization of rescue, mass population movements (refugees, displaced) and the role of the international community in case of a disaster. It will take place at ICDO Regional Training Centre in Lahore, in collaboration with the Pakistan Directorate General of Civil Defence. Closing date for applications: 31 August 1991.

Applications should be addressed to the ICDO Permanent Secretariat, 10-12, Chemin de Surville, 1213 Petit-Lancy, Geneva, Switzerland.

Emergency Planning'91

International Conference (Sept. 8/11, 1991) and Workshop (Sept. 12, 1991)

Lancaster University, United Kingdom

Emergency'91, organized by the Economic and Social Research Council's North West Regional Laboratory of Lancaster University, is intended for professional planners and managers involved in emergency planning and disaster management. The Conference is relevant to international organizations, the voluntary sector, the law, public utilities, the armed services and others in public services.

It will be followed, on September 12, by six optional "one-day awareness workshops" given by faculty members for conference participants who are interested in a non-technical introduction to emergency planning methods.

For more information, please write to: Emergency'91, Conference Office, Bowland College, Lancaster University, Bailrigg, Lancaster LA1 4YT, United Kingdom.

Book Review

The proceedings of the Drought Management and Planning Seminar and Workshop held in Denver, Colorado, on May 30 and June 1, 1990 is now available. (Edited by Donald A. Wilhite, Deborah A. Wood, and Paul A. Kay). The Seminar and Workshop, was organized by the International Drought Information Center of the University of Nebraska. The Proceedings contain more than thirty papers presented by scientists and policy makers. These papers represent a diversity of critical drought-related subjects, including prediction, monitoring, information dissemination, mitigation, response, and planning. The final section summarizes the workshop discussions and recommendations from this meeting.

The Proceedings can be ordered from the International Drought Information Center, 241 L.W. Chase Hall, University of Nebraska, Lincoln, NE 68583-0728, U.S.A.

National Geophysical Data Center Geological Hazards Slide Sets

Seventeen sets of 35-mm slides depicting geologic hazards throughout the world are available from the National Geophysical Data Center (NGDC). Suitable for presentation to both technical and non technical audiences, the slides cover the following topics:

- earthquakes,
- tsunamis,
- landslides
- volcanoes.

*For more information, please contact:
National Geophysical Data Center, NOAA/NESDIS E/ GC4, 325 Broadway, Dept. 758, Boulder, CO 80303, USA or call (303) 497-6958.*

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